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Czech University of Life Sciences Prague

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**Traditional Methods of Human and Animal  
Parasitic Diseases Control-Case study of Angola**

**Bachelor Thesis**

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## **Declaration**

I **Edmárcia Leonor Capata Lumbo** confirm that this bachelor thesis on “Traditional methods of human and animal parasitic diseases control” and the results reported herein are my own independent work, using the sources listed within and in accompanying bibliography of the work. I am humbly appreciative to my supervisor prof. MVDr. Daniela Lukešová, CSc. with the great guidance and support rendered to me.

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Edmárcia Leonor Capata Lumbo

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## **Abstract**

The aim of this thesis was to obtain information about the most widespread parasitic disease in people and animals in Angolan conditions and determine what kind of plants and traditional methods are used for preventive treatment of parasitic diseases to local communities. The work was conducted using information from the available scientific literature sources from science direct, web of knowledge as well as information from official sources of the Ministry of Health in Angola, Ministry of Agriculture, FAO, World Bank, WHO and OIE.

The study on traditional methods used to prevent parasitic disease in humans and animals has been carried out in Angola, particularly in the provinces of Luanda, Benguela, Huambo and Bié. Collection of available information and data was carried out in Angola during July-August 2013 in cooperation with the state workers and local communities. The results were recorded in the developed questionnaires that were distributed to 112 respondents from four groups: employees of the Ministry of Health (MINSa) and the Ministry of Agriculture and Rural Development (MINADER), particularly workers from the Institute of Veterinary Services (ISV), another group consisted of respondents as students, local communities and farmers. For data collection were used two types of manuals: one contained 28 photographs of plants used in traditional herbal medicine, the second manual contains 12 photos with clinical signs of parasitic disease in humans and 13 photos developmental stages of animal parasites. Of the 28 plants listed in the manual, it was stated that 17 species as used for the prevention and treatment of parasitic diseases and mentioned more 15 species not present in the manual. Respondents confirmed the presence of parasitic infestations, especially in rural areas. Approximately 75.9 % of respondents make use of traditional medical practices and 24.1 % had no knowledge of the use of medicinal plants against parasitic pathogens. This Bachelor thesis on the use of medicinal plants for the treatment of serious parasitic disease in selected areas of Angola became a source of valuable information on this area due to the Angolans.

**Keywords:** medicinal herbs, plant extracts, hygiene, Angola, animal parasitic diseases

## **Abstrakt**

Cílem práce bylo získat informace o parazitárních onemocněních nejčastěji rozšířených u lidí a zvířat v angolských podmínkách a dále zjistit, jaké druhy rostliny a tradiční metody jsou preventivně používány k léčbě parazitárních onemocnění místními komunitami k prevenci. V práci byly zpracovány informace z dostupných vědeckých literárních zdrojů ze ScienceDirect, Web of Knowledge, dále z oficiálních zdrojů Ministerstva zdravotnictví a zemědělství v Angole, FAO, WHO a OIE. Studium tradičních metod, využívaných k prevenci parazitárních onemocnění lidí a zvířat, bylo prováděno v Angole, zejména v provinciích Luanda, Benguela, Huambo a Bié. Sběr dostupných informací a dat byl proveden v Angole v průběhu července až srpna 2013, ve spolupráci s pracovníky státní správy a místními komunitami. Výsledky byly zaznamenány do vypracovaných dotazníků, které byly distribuovány 112 respondentům ze čtyř skupin: pracovníkům Ministerstva zdravotnictví (MINSÁ) a Ministerstva zemědělství a rozvoje venkova (MINADER), zde konkrétně pracovníkům z Ústavu veterinární péče (ISV). Další skupiny tvořili respondenti z řad studentů, místních komunit a zemědělci. Ke sběru dat byly využívány dva druhy manuálů: první obsahoval 28 fotografií rostlin používaných v tradiční herbální medicíně, druhý manuál obsahoval 12 fotografií s klinickými příznaky parazitárních onemocnění lidí a 13 fotografií vývojových stádií parazitů zvířat. Z celkového počtu 28 rostlin uvedených v manuálu, bylo uváděno, že 17 druhů se často používá k prevenci a terapii parazitárních onemocnění a byly citovány další 15 rostlin které nebyly v manuálu. Respondenty byl potvrzen výskyt parazitóz, zejména ve venkovských oblastech. Přibližně 75,9 % respondentů bylo informováno o využívání tradičních medicínských postupů, pouze 24,1 % se dosud neseťkalo nebo nemělo znalosti s používáním léčivých bylin proti parazitárním původcům. Bakalářská práce se stala přínosnou díky zdrojům cenných informací od Angolanů o využívání léčivých rostlin k terapii závažných parazitárních onemocnění, ve sledovaných oblastech Angoly.

**Klíčová slova:** léčivé byliny, rostlinný extrakt, hygiena, Angola, živočišné parazitární nemoci

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## **Acronyms**

BNA National Bank of Angola/Banco Nacional de Angola

CISA Center of Health Searches in Angola/Centro de Investigaçao de Saúde em Angola

CULS Czech University of Life Sciences Prague

FAO Food and Agriculture Organization of the United Nations

FAOSTAT Electronic Statistics Service of FAO

FMV Faculty of Veterinary Medicine/Faculdade de Medicina Veterinária

GDP Gross Domestic Product

HAT Human African Tripanosomosis

ICCT Institute of Combat and Control of Tripanosomosis (Angola)

IIRR International Institute of Rural Reconstruction (Kenya)

ISV Institute of Veterinary Services/Instituto dos Serviços Veterinários (Angola)

ITDG Intermediate Technology Development Group (Kenya)

MINAGRI Ministry of Agriculture Rural Development and Fisheries

MINADER Ministry of Agriculture and Rural Development/Ministério da Agricultura e Desenvolvimento Rural (Angola)

MINSA Ministry of Health/Ministério da Saúde (Angola)

OIE Office International des Epizooties

PNDS National Plan of Sanity Development/Plano Nacional de Desenvolvimento Sanitário (Angola)

SADEC southern African Development Community

SNS National Health System/Sistema Nacional de Saúde (Angola)

UNICEF Unit Nations Found for Children

WHO World Health Organization



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## 1. Introduction

Traditional medicine is widely expanded approximately over the world and such practices were already reported in ancient China, India and Egypt many years ago (Fajimi and Taiwo, 2005). According to MINSA and WHO (2012), due to low level of medical assistance and also because of the incidence of many diseases, almost 80 % of the population in Africa depend on alternative medicine to resolve most problems in the health area, starting from the rural areas to urban In developing countries such as Angola, there are several problems in the area of health, starting from the rendering of services until the acquisition of medicines. Population in those areas due to this situation always resort to traditional medicine for first aids.

Angola is one of the many countries beset by health problems and low level of medical assistance, as well in veterinary medicine as in humans or public health. Approximately 25 % of infant mortality are caused by diarrhoea which is also related to child malnutrition that leads to the weakness of the organism and as a consequence arises the ancestry of many diseases in the region, then also malaria that in which 100 % of the cases are caused by the pathogen *Plasmodium falciparum* is a big problem of public health, other parasites come in the second place (WHO, 2012). On the other hand there are the incidence of those diseases are a consequence of a great large of problems in almost all parts of the country, with the sanitation, hygiene and lack of best control in animal production, and this situation facilitates the rapid proliferation of a big number of animal parasitic diseases with an incidence in cattle and poultry production, there are for example several problems with intestinal worms in cattle, pets and poultry production.

According to Ministry of Health of Angola in Portuguese Ministério da Saúde (MINSA), the Angolan government is trying to analyse the possible combination of conventional and unconventional medicine, starting to invest searches more searches about the use of those herbs, is also trying to promote policies that favour the development of unconventional practices and policies that regulate and provide better control on the use of phytopharmacy by the population in the country (MINSA, 2012). In animal health the use of ethno botany is expanded in both handling of small herds, farmers as well is used by veterinaries services controlled by government. Also in public health those plants are used for treatment and prevention of many diseases. For example are used plants as *Chenopodium ambrosioides*, *Allium sativum*, and some others herbs to respond the demand of remedies,

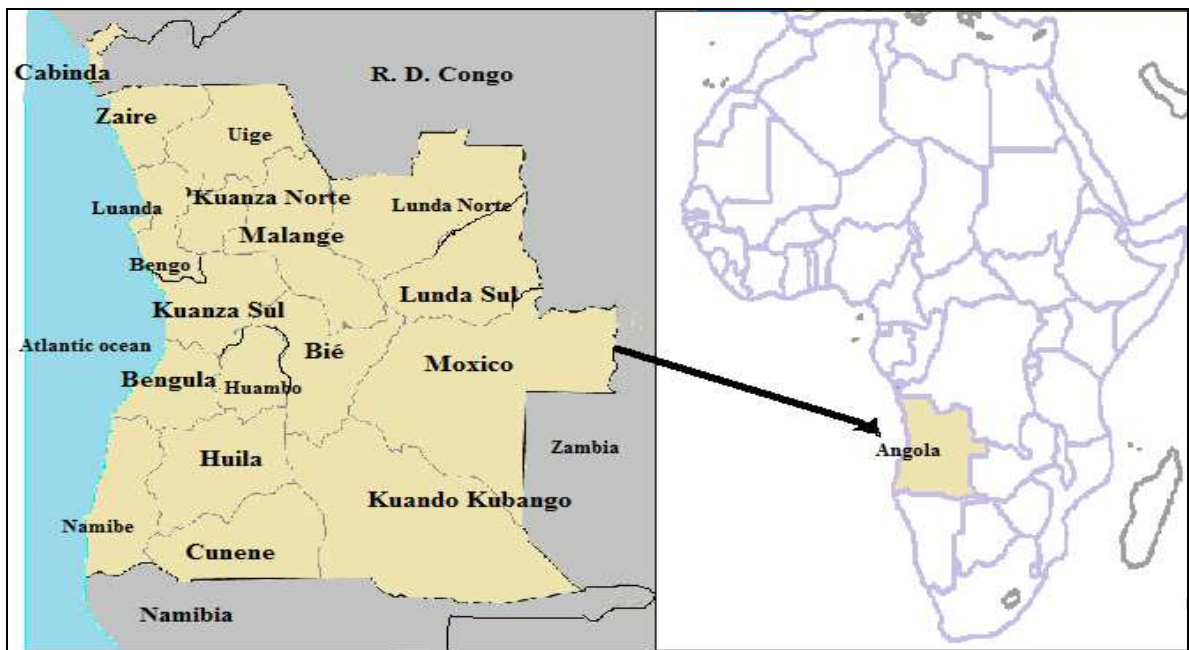
(Rosario, 2010). In general ethno-pharmacology in parasites is expanded in approximately the entire country, varying from region to region and with small differences in their ways of uses, occasionally linked to beliefs and culture of the region as in each part of Africa as well (Karhagomba *et al.*, 2013), however in all of these situations are find many common problems that hinder the proper functioning of traditional medicine in the country. For example there are many lacks as: lack of available literature about the correct use of these plants, lack of guides on how to manage, how to correctly conserve and administrate these remedies; there is also a lack of knowledge about real chemical composition of used herbs, a lack of good orientation and organization that ensure such practices (Queza, 2010). Despite the mentioned challenges it is observed that knowledge is passed from generation to generation from old people to the young generation. This serves as the main mode of information transfer .This is considered as the main source of information and knowledge continuity in many families in Africa. However, through the migration of young people from the village to the cities occasionally, this knowledge is lost because they are not written down and were underutilized.

## 2. Literature review

In this review, an attempt is made to understand the main terms, such as parasites and their cycles, climate influence on their development, ways of infection by parasites and as well as make an effort to understand the actual situation of public health and medical assistance, the actual state of veterinary assistance in animal production in the country and in addition the use of ethno botany as alternative to solve these problems. Furthermore, an overview of the country (study area) in various aspects is carried out.

### 2.1 Angola overview

The Republic of Angola is geographically located in Southern Africa, with an area of 1, 246, 700 km<sup>2</sup>. The country borders with the Atlantic Ocean in the West, Congo Democratic republic also known as Zaire to the North, Zambia to the East and Namibia to the South. Angola is divided in 18 provinces and the capital of the country is Luanda, as shows the figure 1 (mission-Angola, 2009).



**Figure1:** Division and location of Angola (Orig. Edmárcia Leonor Capata Lumbo)

Portuguese is the official language in the country and other national languages are alternatively spoken by the population depending on the regions: Umbundu, Kimbundo, Kikongo, Chokwe, Nhanheca, Gangela, Kioku and Fiote, (Mission-Angola, 2009). Angola

was a Portuguese colony approximately 500 years moreover was converted into independent in November of 1975. The highest point of the country is the Morro do Moco Mountain with 2,610 m which is localized in Huambo province. The plateau region, include Bié and Huambo provinces, the 18 provinces that compose the country are: Bengo, Benguela, Bié, Cabinda, Cuando Cubango, Cuanza Norte, Cuanza Sul, Cunene, Huambo, Huíla, Luanda (the capital of the country), Lunda Norte, Lunda Sul, Malanje, Moxico, Namibe, Uíge, Zaire (Eltangola, 2013).

### **2.1.2 Angola – Climate**

Angolan climate is not distinct of others African tropical countries, where the weather is divided in two alternating seasons, rainy and dry. The climate varies significantly from the coast to the central plateau and even between the north coast and the south coast. According to Climatemps (2013) 49.4 % of the climate in the country is humid tropical, wet and dry climate in the north region from Luanda up to Cabinda, approximately 12.3 % of the country has the semi-arid or steppe climate correspond to south area, nearly 3.6 % has a arid or desert climate in the province of Namibe, finally 34.8 % has a temperate and mesothermal climate with dry and cold winters this last in central plateau, area from Huambo, Huila and Bie. The annually rainfall varies between 1250-1750 mm.

### **2.1.3 Hydrographic Situation**

Angola has plenty of great rivers from north to south, Cubango and Cuando Rivers flows into Namibia, Zambia and to the province which is denoted as the Cuando Cubango along with Kuito (Bié). From central plateau (Bié) to East (Luanda and Bengo), flows the major river of Angola, the Kwanza River – giving the name to currency of the country, the Kwanza. It constitutes as one of the main sources of water for many regions in Angola. In the Northeast of Lunda provinces is an important hydro graphic network composed of a dozen rivers originating in Angola debouching to neighbour countries. For example, Zambezi one of the largest rivers of Africa (after the Nile and Congo River) which flows into Mozambique, starts in Eastern Moxico. In Northern Angola, there is the Congo River. A number of other small rivers flow from south to north. Marking the Northern border with the Democratic Republic of Congo formerly known as Zaire is the Congo (Zaire) River (Ebonet, 2013).

### 2.1.4 Economic Situation

Through 11 years of peace, the economy of the country is growing moreover Angola became a promising country to invest in different areas such as in, mineral extraction, agriculture, industry and others, according to National Bank of Angola (BNA) in 2011 Almost 47.06 % from Gross domestic product (GDP) comes from petroleum and 0.78 % from diamond extraction, agriculture sector contribute with 9.85 % on Gross domestic product (GDP) of the country (BNA, 2012). As show the trends in Table 1 the percentage of different sectors in Gross domestic product (GDP) contribution according studies carried out by National Bank of Angola, we can repair that over the years there was more investment and economic growth in mineral area, the Gross domestic product (GDP) values are higher in petroleum extraction, thus hindering a little investment in agriculture.

**Table 1:** Contribution of the various sectors over the years in GDP of the country

Sector	Epoch and percentage structure (%)					
	2006	2007	2008	2009	2010	2011
<b>Agriculture sector</b>	7.34	7.74	6.58	10.21	9.86	<b>9.85</b>
<b>Fisheries and Derivatives</b>	0.31	0.28	0.23	0.25	0.23	0.21
<b>Diamonds sector and Other</b>	2.33	1.77	1.07	0.91	0.96	0.78
<b>Petroleum</b>	55.71	55.81	57.92	45.56	45.94	<b>47.06</b>
<b>Industry sector</b>	4.83	5.31	4.92	6.23	6.28	5.84
<b>Construction sector</b>	4.34	4.93	5.17	7.70	8.14	7.74
<b>Energy</b>	0.09	0.08	0.09	0.13	0.13	0.13
<b>Merchant services</b>	16.76	16.91	17.92	21.23	21.04	21.19
<b>Others</b>	8.28	7.17	6.10	7.77	7.42	7.20
<b>GDP at factor costs</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
<b>GDP at market prices</b>	<b>99.69</b>	<b>102.00</b>	<b>102.50</b>	<b>101.52</b>	<b>102.54</b>	<b>102.50</b>

Source: National Bank of Angola (BNA, 2012) from Portuguese to English

In condition that the government increase more investment in agriculture production and health care would be a start for resolution of many problems such as hunger, malnutrition and onset of many diseases in the country, even to reduce the percent of people who lives in poverty that is approximately half of the population in the country (Oliveira, 2012), it

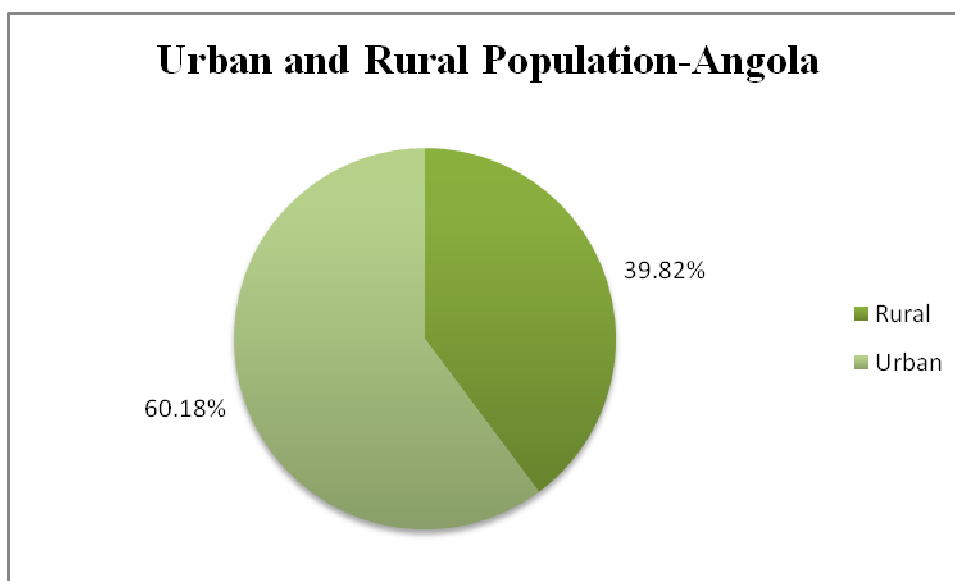
would be excellent to start with more investments in production and manufacturing sectors. Still now is observed an assortment of people suffering without job and basic conditions for life. According to surveys done by a group of Angolan students Ribeiro *et al.*, (2009), Angola is considered a country with most rich natural resources. In the country, there are a lot of reserves of diamonds, oil deposits, marine and water resources with a great economic potential, Angola has a very fertile land and a favourable climatic conditions for plant and animal production. It is the second most important country in the oil production and exportation and the fourth most important diamond producer in sub-Saharan Africa. According to Oliveira (2012) however despite all these features, Angola remains one of the poorest countries in terms of living conditions and in various sectors that would be the basis for improving the living conditions of the population, such as there are at a halt several problems in the sectors of education, health and agriculture.

After the independence from Portugal in 1975, took place a civil conflict between different politician movements within the country, this war occurs in three decades. A ceasefire went into effect in 2002 (WHO, 2005). According to World Bank (2011), the population is estimated to about 20, 82 million and is presently growing at an approximate annual rate of 2.4 % and the life expectancy is around 51 years (Faostat, 2012). Due to drawn-out civil war, there are a assortment of lacks in the country as for examples, lack of good roads from rural areas to the city, that difficult a quantity of farmers in the transport of their products to from the camp to the cities in addition to difficult the transport of products from the city to rural areas, as for example distribution of remedies to rural areas.

### **2.1.5 Agriculture in the Country**

Angola is considered a great potential, the used arable lands was around 4.10 % in 2011, which correspond to approximately 573,000 kilometers squared of arable land, the country is also covered of a favorable climate to agriculture (FAO, 2012). However the Angolan GDP in 2008 counted with 10.06 % of Agriculture including the forestry sector, hunting, and fisheries, as well as cultivation of crops and livestock production, compared with 18 % in 1990, on the other hand, agriculture is the fundamental activity of the rural population that correspond to 39.82 % of the population in the country, as shows the Graphic 1 (FAO, 2012). Approximately half of the population has the agriculture as primary activity as

reported Rosario (2010), despite the large number the population working in agriculture is still theme the main problems of hunger in the country, until now there is not a further development of manufacturing industry, also the distribution of agriculture products from the rural places to another urban is still limited. There are still major shortages of transport, occasionally small farmers have to walk long kilometers to distribute and do the commercialization of their products from rural areas to the city, what gets to be extremely laborious for them.



**Graph. 1** Population in rural and urban area (Source: FAO, 2012)

During the civil war period between 1975 and 2002 the improvement in agricultural sector was impossible moreover is observed the results and consequence of the war. Large number of land remains uncultivable for the reasons that are still landmines (UNICEF, 2004). Functioning infrastructure in rural areas are still limited, and there is no motivation for people who migrated from rural areas to the cities during the war period to return to farming.

The country is characterized by two types of agricultural production: the traditional or subsistence agriculture and the commercial type. In subsistence agriculture production are used small yields and the production is oriented mostly for family consumption. This type of agriculture has several problems, such as the damage of the remaining produce, due to poor condition of roads from rural areas to the cities. These products cannot be transported to other parts of the region and end up getting spoiled. Another situation is that, the



population in rural areas lack proper storage facilities. Agriculture for commercial purposes, use up more land, more mechanization and more monetary investments (MINADER, 2003). However, the country is currently not auto-sufficient in agricultural production and still needs to import the major part of products (Rosário, 2010).

### **2.1.6 Medicinal Plants in the Country**

According to Bassene (2008) the use of traditional medicine is often beneficial not only to requirements stated above such as deficiency of medical assistance and lack of medicines but can also be alleged that, the use of traditional medicine is also beneficial for better exploration and use of botanical resources in certain region. Plants with therapeutic potential are derived from distinct areas from the country, even as far as from other countries such as china. Although, the local population has access to extensive knowledge about the use, application and handling of these plants, there is an assortment of lacks and negative situations in difficulties in the use of herbs to cure several diseases in the country. The challenge posed is a lack of reports and updated publications on the topic unconventional medicine. Traditional healers and the population of the country in general hold a vast knowledge about local flora, the mode and its applicability in several fields of the day to day life. Conversely this knowledge remains as a family secret by traditional and culture reasons and acts as a barrier for new research and development in this area. Traditional medicines are sold in informal markets by people and herbalists, without any control and inadequate storage conditions (Queza, 2010). The way these plants and their particular healing power are discovered is associated to methods of attempt using and subsequently oral transmission of acquired knowledge from generation to generation. With the development of the cities and migration of young people from specifically rural areas to the cities, this knowledge is getting lost. Looking into perspective to the reality, it is observed that there is a great knowledge on the potential of these plants, although the situation is that only half part of this knowledge are useful. Ethno botany emerges as an academic discipline to bring this knowledge to the science, studying the relation between plants, their medicinal power and traditional uses by people (Queza, 2010).

According to Rodrigues (2007) Ethno botany is a science that reaches as wide as science, linguistics, botany, sociology, anthropology, phytopharmacy, medicine, history, herbal

medicine and the term was used for the first time by the American botanist John W. Harshberger in 1895. Medicinal plants are all these that have actively help in the treatment of diseases and can even lead the cure (Gustavo and Gloria, 2010). The use of medicinal plants has several advantages for the target patients, unlike chemical drugs that expose the patient to various side effects during their use. Phototherapeutics resources restore health and promote the well being of the organism (Moreira *et al.*, 2002), however have to take into account the strengths and the correct use of such plants, thus the population should take this into account moreover try to be better informed about the ways of preparation and use of most commonly medicinal plants. Ethno biological provides great knowledge responses during the treatment of many parasitic diseases and eliminating of some vectors, such as the use of several traditional plants as repellents or insecticides (Rodriguez, 2007). In Angola there is no a great shortage of available literature related to the use of plants, however, the majority of the population makes use of medicinal herbs to compose the first aids (MINSa, 2012) in several cases even up to a full treatment of various parasitic infections. According to the Ministry of Health of Angola (2012) due to low level of medical assistance and slow progression of health services in the country, the Angolan government is trying to promote policies that favour the development of unconventional practices, starting to invest in more studies and researches in this area. For the reason that on the other hand traditional medicine is gaining popularity in last decades, not only the rural population make use of these methods, although as well people from urban areas. Many plants are used and the interest in ethno botany has increased dramatically in recent years.

Most of these plants are imported to Angola from other countries as Brazil, china however is observed that the major part of plants that people are using for treatments and control of some diseases, grow inside the country conditions and climate (Queza, 2010). The handling of medical plants can vary from region to region, however the principal forms and ways of transforming these plants do not differ greatly. According to CISA (2012) the preparation and transforming of commonly used medicinal plants are quite the same in the entire country, starting from boiling, teas, pasts used as anal, oral application and superficial application in case of problems with skin, wounds and external diseases.

### **2.1.7 Animal Production**

According to MINADER (2003), the livestock production in Angola plays a great role in the socio-economic life of the population moreover presents one of major sources of income for many families main in rural areas. The most important animal products are: beef (bovine meat), poultry products (meat, eggs), mutton (goats and sheep meat), pork (swine meat) and specie more sought is the rabbit. In animal production, the cattle production constitutes a very important activity and is predominantly in the Southern and Central Plateau region. It is primarily used in animal traction then is also important the consumption of milk as a food traditional supplement and for meat. The majority of the entire cattle herd is concentrated in the south province of Huíla, Cunene, Namibe and Benguela, which is almost the major part of the cattle production in the country than 60 % of the small ruminants. According to the Institute of Veterinary Services of Angola (ISV), are at the moment created the following animal species, from cattle: Sangha (Nguni, Mucubal), Bosmara, Brahman, Nellore, Simmental in addition to Holstein and Jersey for milk production; Zebu, Afrikaans, (meat production), Charolais and Brown Swiss (mixed production). From swine: Ganda I, Ganda II in addition to Large White, Landrace and Duroc adapted in lasts years. There are also some equine breeding, but in small-scale. From small ruminants (sheep and goats) there are the Caraculo, Merino and Persian breeds, Boer goat and the Algerian are found in the country. Chickens, pigeons, ducks and turkeys are introduced in poultry production, (MINADER, 2004). Half of consumed meat in the country comes from cattle and poultry production.

### **2.1.8 Animal Hygiene and Sanity**

Hygiene and sanity for animal health and wellbeing is the step number one to good and qualitative animal production and thus also providing consumers food on quantity, quality and safety. According to World Organization for Animal Health (2011) there is no animal welfare legislation that promotes the protection and safe production on animal creation and production in Angola. For better control of animal production and safety during processing of animal products, the government of Angola in accordance with the FAO approved the law of animal sanity. The law reviewed many times, the last review in June 2011, was approved by the general assembly of the Republic of Angola. The follow Law 4/04 of Animal Health, published in Gazette of the Republic of Angola (Diário da República,

2011). The law cited above essentially governs all activities related to animal health, hygiene in animal production, industry of transformation, the use technology in animal production, security during the import and export of animals, conditions in storage of animal products in the country (MINSAs and WHO, 2010), the law also expose zoo sanitary standards during the creation of the animals, as well as during slaughter.

According to MINADER (2004) the Institute of Veterinary Services of Angola (ISV) is responsible to do regularly inspections under the animal health law, in order to guide the slaughterers and butchers to comply with stricter rules of hygiene and sanity; however the real situation is that still now there are serious problems of hygiene and sanity in animal productions. For example according to the portalangola (2008) in this same year 2008 were inspected 610 cattle slaughterhouses by technicians from Institute of Veterinary Services (ISV) in Luanda province and most of them had several hygiene problems. In present times continue the inspection of places with greatest flow and demand of meat, mainly directed to slaughterhouses on cattle meat production although still there are many other small and large slaughterhouses across the country without conditions and with great hygiene and sanitation problems. According (2005) to MINSAs in 2001 searches indicate that approximately 60 % of the population had no access to safe sources of water and 40 % to a sanitary sewer system.

### **2.1.9 Angola Health Situation**

According to Calum (2005), the World Health Organization report from 1997, the parasitic zoo noses were a cause of 43 % deaths in developing countries where are observed many problems with medical assistance. The medical assistance in Angola is ranked among the worst in the world. Angola is located in the endemic area of malaria diarrheic diseases, infant malnutrition and child mortality. Still now only a small fraction of the population receives medical assistance even in urban areas. There is a great scale of problems that has influence in the actual worst situation of medical services in the country (WHO, 2012).

In 2007 the “government expenditure on health was regarding only 5.3 % in 2012 comparing with the period from 1997 to 2001 that was 3.3 % have increased, however is still low to cover all health activities and needs from the country, while the average for the SADC countries was 7.2 % which is very low compared to the total number of population

(WHO and MINSA, 2012) .During the war period concerning 65 % of the health units were destroyed and the major part of the equipments were stolen and deteriorated from lack of maintenance, (WHO, 2005). On the other hand the war period finished 11 years ago, more than half of these health unit had to be rebuild and approximately in every part of the country, starting from the urban and rural areas were build new hospitals as well as health centers, however is not enough comparing with the number of population that grows faster, are increased many other problems related to: lack of information to people, poor maintenance of sanitary unities, there is no a good communication between workers of ministry of health with the population (Queza, 2010), as mentioned above there are as well problems with financial resources on health area, there are also great weakness on health education, another problems are associated to poverty and unsafe access to food and water, poor home conditions are also a large taboo in the life of the population. The lack of a good system of supervision on sanity and hygiene in hospitals and health centres, the negligence of people, in another words, people just do not see, do not cooperate and do not give attention to advices of hygiene and sanity, in addition advice to how to keep house moreover how to care of the household waste as a base of prevention to eradicate the proliferation of same infections, what is developing in recent years, thanks to the great efforts of the Angolan government as reported by (Paulino, 2003).

Parasitic diseases are one of the mainly frequent in Angola, mostly not indicate a significant danger; however it is worrying how these diseases spread by country, becoming a major problem both in animal production, present a great fight for breeders and veterinarians us well for doctors in human health. According MINSA (2012) was elaborated a National Plan of Sanity Development for 2012 to 2015 (PNDS) by Ministry of Health of Angola (MINSA), estimate that the most frequently parasitic diseases in the country in lasts years are the follows:

Malaria is the principal parasitic disease that infest the population and is endemic in the region (Tavira, 2010), is an acute febrile infectious that is caused by the agent *Plasmodium* spp., that represent more than 100 different genus, but the genus that parasites in human body are four, *Plasmodium falciparum* causes more than 87 % of the cases of malaria in the country and then come another genus on lower scale percent of causes *Plasmodium vivax* (7 %), *Plasmodium malariae* (3 %) and *Plasmodium ovale* (3 %), transmitted by the bite of mosquitoes of the genus *Anopheles gambiae* which still accounts for about 35 % of

the mortality in the hospitals , almost 60 % of hospital admissions, are children above 5 years and 25 % of maternal death is caused by this terrible infection in all the country, (CISA, 2011).

Human African Trypanosomiasis (HAT) also known as sleeping sickness transmitted by tsetse fly genus *Glossina* that carry the parasite *Trypanosoma brucei gambiense* in the salivary glands of the fly (Pereira *et al.*, 2011). The infection is mostly endemic in north regions of the country as Uíge, Zaire, Bengo and several parts of the capital Luanda. Surveys provided by MINSA show a decline of HAT case in the country in the last ten years, having been 2011 only 69 cases in endemic regions from North of the country, comparing with 8175 cases in 1997 and 3 cases in 1974 present a particularly difference. Concerning to the fight against this terrible disease is the program to combat trypanosomiasis led by Institute of Combat and Control of Trypanosomiasis of Angola (ICCT) in collaboration with the National Health System of Angola (SNS) and World Health Organization (WHO), which prepared a program of tax traps for collecting flies of genus *Glossina* (MINSA, 2012). Recent searches from ICCT show that from trypanosomiasis or “sleep disease” Angolan population is now out of danger and even in endemic regions in first semester of 2012 were registered 8 cases what is considerable, in recognition to such arduous effort of national and international institutions cited above (MINSA, 2012). Other tropical parasitic infections is the schistosomiasis caused by plathelminthes worms of the genus *Schistosoma* with species *S. mansoni* and *S. haematobium*, through more incidence in north area of the country as in the province of Bengo and Uíge. Lymphatic filariasis also known as elephantiasis caused by the nemathelminthes of superfamily Filariae, transmitted by mosquitoes of genus *Culex* or *Anopheles*, this last predominates principally in the province of Moxico and Cuando Cubango. Other roundworms and geohelminthosis as *Acaris* spp. are also found in almost all the regions (MINSA, 2012). The presence of external parasites is not discarded, with an incidence of head lice, mostly in rural areas. There are several incentive programs to fight against these diseases led by the government of the country in cooperation with world units as United Nations Fund for Children (UNICEF) and World Health Organizations (WHO).

## 2.2 Parasites Overview

According to William (2001), parasites are a group of invertebrates and small animals that are found in other animals. Many studies show that parasitic infections are more frequent in tropical countries, where the sanitation and hygiene are still a large problem, due to poverty, lack of information, lack of conditions and facilities for preparation of food, lack of treated water and pollution of the environment. The majority of times in developing countries for the reason that people do not have information about the serious problem that represent these organisms and microorganisms, is observed an increase of these diseases in these regions.

However according to Matějčíková and Sovják, (2009) these infections are not simply in tropical and poor countries, as a consequence of globalization, travels and the movement of the world population from one place to other, situations of migration and food market, these infections are expanded in approximately every part of the world, several parasitic diseases from food diseases approach not simply from tropics, although from another countries to tropics. Most of the poor countries receive food from other countries, such as meat, milk and poultry. In special countries from Africa and Asia receive food from every part of the world, moreover suffer with all those problems due to the lack of control and trained personal in the food as well as nutritional area, in this context with the international travel, import and export the contamination of food have increased. According to Doyle (2003), the term parasite include the organisms that obtain their food from other living creatures, occasionally causing pathology to the host organism, moreover on occasion living in harmony without causing serious problems to the host. Parasites include protozoan animals, worms varying from few millimetres to diverse meters of extent to constitute the mayor part of parasitic disease, such as helminthes resembling trematodes as *Fasciola hepatica* cause of fasciolosis in cattle sheep and other vertebrates including humans (Němejč and Lukešová, 2012) and nematodes as *Ascaris lumbricoides* so as to infect more than 40 million people in the world, especially in Africa, Asia and Latin America (Matějčíková and Sovják, 2009). Parasitic diseases are from various origins, such as from food, from water, from other animals to humans denominated zoo noses or even from vegetables. Varying from the species of the parasite, type of host and conditions of life, parasites may present different cycles. Endoparasites reside in the interior or inside the body of the host, ranging from various small species of protozoa as genus *Trypanosoma*

with a measure of 0,2 mm, to long metres of dimension such as *Taenia solium* which can measure 3 m in human body, parasites know how to cause irritation mainly to the walls of the circulatory and digestive systems of the hosts, as well are able to secrete various toxins to the body of the host, they are moreover capable of destruction of the host body by absorbing nutrients, leaving them weaker. Ectoparasites are parasites living on the exterior of the host body causing an irritate sensation to the host (Lukešová *et al.*, 2008), a higher level of infection in the skin causing the skin inflammations and eczema (Knollová, 2013).

### **2.2.1 The Cycles of Parasites**

Parasitism is defined as the association between the organisms (host) and the parasite (Scott *et al.*, 2013). In this association are always benefited the parasite and the hosts are in most of times the injured part of this unification. The same association may be temporary or may well be to the entire the life cycle of the parasite, in this case permanent association with the host. During the control of parasites one of the most important steps involves to understand the life cycles of these organisms, for the reason that these pathogens have different stages in their life and it may be useful for best control and management with them, several pathogens in other side may have all life cycle still the end of life presently in one host, another important point in the study of their life cycles is that with the knowledge of their cycles we can easily knows where and how they can be destroyed (James and William, 2013). According to Doyle (2003) a good knowledge concerning to the life cycles of parasites could be useful for example in case of helminthic diseases in humans, as well as in animals in which are used anthelmintic medicines for their eradication, studies show that approximately mostly during the adult stage, these helminthes may possibly cause several pathologic changes within the hosts body. The table 2 presents a different stages and pathogenic changes that parasites possibly will originate in their hosts body. On the other hand must give attention to the eggs of some nematodes as for example the genus *Ascaris* spp. comes to be very resistant (Doyle, 2003; Šoch *et al.*,2011).



**Table 2.** Stage of helminthes and several pathologic changes in humans

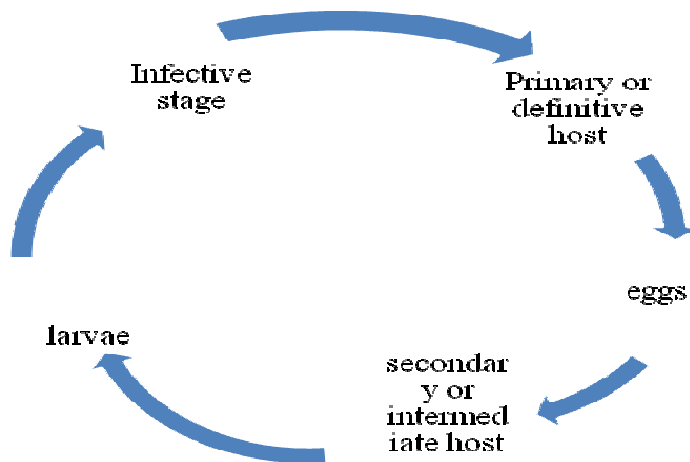
Helminths	egg	larvae	adult form
Cestodes ( <i>Teania solium</i> )	-	+/-	+
Nematodes ( <i>Acaris sp.</i> )	-	+/-	+
Plathelminths	-	+/-	+

Source: Doyle 2003

It is as well important take to account the life conditions of the hosts when the pathogen have more than one host, sometimes is still need a special control and study of the intermediate hosts, occasionally for example can moreover be necessary the eradication of the intermediate host from alimentary diet of definitive host or from water used for people consume, according to Kubik *et al.*, (2010) it is for example the case of *Trichobilharzia* spp. has as intermediate host mollusks living in rives where humans people usually swim and can be infected by swimming in contaminated water. On the other hand to control the contamination of these mollusks may be for example eliminate from places (lakes and rivers) where people take wash or swim and animals drink water by treatment of the water, however occasionally, people also do not have information about how great these animals can be dangerous. The parasites present different stages during their life cycles, due to this situation, they also need unusual hosts that can support and give them preeminent conditions for each stages of the cycle. In that context, require a host with conditions to maintain for example the larval stage, the same in the adult stage will need other type of ambient, another type of food and of course the way of getting nutrients is also different, so will need another host that will offer better conditions for sustenance in this stage of his life (Doyle, 2003).

### **The many components of parasite cycles**

Again according to Doyle (2003) mentioned above, are classified three principal types of hosts according to the extent of stay in the hosts as sowed in figure 2. For example the genus *Schistosoma* in definitive host human and other vertebrates eliminate the eggs with the urine or faeces, the mollusks intermediate host eliminate the larvae (*cercariae*), which also has to develop to infective stage to primary host.



**Figure 2:** Different hosts and stages of parasites (Orig. Edmárcia Leonor Capata Lumbo)

The secondary or intermediate host care the parasite in the immature or larval form of their life sometimes even only eggs form, definitive host also known primary as hosts care the mature stage of the parasites, in certain cases there are just the relation host-parasite without causing, any pathogenic changes to the host cell or organism, just serve as a transport hosts for the parasite. According to the number of hosts parasites are classified as having just one host during all the cycle, two or more host during the life cycle (Doyle, 2003). Parasites present different cycles, depending on the need of nutrients, depending also on the way of survey each parasite has developed, depend also on adaptation of the parasite to just one host, or if will need more than one host to survey. According to that has also developed many forms of transition from one host to another. Parasite with one intermediate host needs only one host for maintenance of all stages of his life, these parasites are also called parasites with monoxenic cycles simplification of the cycle: Parasite larvae or eggs to the host who will care the parasite still the end of his life cycle (Carvalho, 2003). For example is the case of species *Ascaris lumbricoides* and *Taenia solium*. Parasites with two or more intermediate host for the maintenance of their life cycle need more than one host, it is for example the case of *Toxoplasma gondii* (Lukešová and Literák, 1997), which has as definitive host cats but present one large number of intermediate hosts and even can parasite the human body (Kubik *et al.*, 2010).

### **2.2.2 Climate Influence on Development of the Parasites**

The tropical climate is characterized by high temperatures which facilitates and promotes resistance to diseases and parasites. The frequency of the apparition of many parasitic infections depends on the complex interactions between hosts, parasites and the environment around them, when we search about the life cycles of parasites, the influence, and the interactions between parasites and hosts, we have also to consider the climatic and other abiotic factors related to their ecosystems and the relationship between them (Medeiros and Vieira, 1997). Abiotic factors as humidity, the extent to human behaviour has influence on proliferation of these parasites, the influence of temperatures mostly for example a observation done by a group of workers Ministry of Agriculture from Brazil in 1986 verified that, definitively biological cycle of parasites is significantly affected by ambient temperature and that an increase of the temperature may favors propagation of some parasites (Bueno *et al.*, 1986), are some of parameters, who also deserve the greatest attention during the study of parasitic cycle and thus form concrete ideas during the control and fight against parasitic infections. For example the mosquitoes appear more in Tropic and sub tropic areas, where the weather is hot; humid what is necessary for his development. According to (Šoch *et al.*, 2011), the humidity and solar radiation are also some important aspect to considerate in development of parasites. Also according to William and Wilson (1999), the subtropical and tropical climates with their distribution of rainfall during the year and warm weather almost throughout the major part of the year, favors the development of external and internal parasites. Breeders and livestock production in general, in tropical regions, are confronted with several limitations in the productions.

### **3. Objectives of the Thesis**

The principle aim of this work was to compose a study about the actual situation in the use of medical plants for the treatment of parasitic diseases in humans as well as in animals in Angola; specifically in four regions of the country namely: Huambo, Luanda, Bié and Benguela. In this context was set the follow hypotheses; most of respondents had some knowledge linked to the use of traditional medicine. The hygiene and sanity conditions are poor and contribute for the apparition of parasitic illnesses.

From the point of view were specified the main objectives: to identify which parasitic infections have more incidences in the country and secondly determination of the mainly used plants to the treatment of these illnesses and the study was also concerned to identify which methods of prevention are used.

## **4. Materials and Methods**

The methods used in this work were submitted by the requirements: to understand the actual situation of traditional medicine in the region, to identify which of parasitic infections plagues more the country and which are the most used plants for eradication of these illnesses.

### **4.1 Collection of Secondary Data**

The secondary data collection, included information from literature review, was directed to obtain information relating to the current situation regarding parasitic infections in Angola in humans as well as in animals. The literature searches were taken out during the period from November 2012 to December 2013. The review was conducted using books and final bachelors and diploma thesis from Czech University of Life Sciences (CULS Prague), were used data from belonging web pages from Agricultura Tropica at Subtropica, documents and data based on internet sources from Food and Agriculture Organization (FAO) and recent data from Faostat, publications, documents in addition to articles from World Health Organization (WHO), data as well as reports from Ministry of Health of Angola in the webpage (MINSA) publications from Ministry of Agriculture Rural Development of Angola (MINADER). Were also used data from World Bank along with articles from recognized WebPages as science direct (SCOPUS) and Web of Knowledge (Thomson Reuter). The same as a support for this thesis were as well used statistics databases from National Bank of Angola in the web ([www.bna.ao](http://www.bna.ao)), articles, publications as reports from Research Centre in Health of Angola (CISA) and data from World Organization for Animal Health (OIE) and available literature in Portuguese language.

### **4.2 Collection of Primary Data**

The primary data were collected during a travel to Angola, from July to August 2013 especially to four regions of the country, namely: Luanda, Huambo, Benguela and Bié, there were distributed questionnaires divided in four different groups or categories: Workers from the Ministry of Health (MINSA), 8 questions in the questionnaires, this group have best information on parasites in human and for sure know something related to traditional remedies. Workers from the Ministry of Agriculture and Rural Development

(MINADER), properly workers from the Institute of Veterinary Services (ISV), questionnaires contained 5 questions, this category has information on parasites in animals and certainly knowledge on traditional medicine. Students and householders questionnaires within 3 questions. This group certainly has some experience with the use of herbs. Finally farmers, where the questionnaires contained 5 questions. This last certainly have more experience using traditional medicine against parasites, were in total 21 formulated questions for the researches (see appendices). The two last categories farmers, students and householders were more interactive, for the reason that respondents could talk more about their experiences, results and difficulties encountered in their attempts to use these medicines. In some cases were photographed some of the used plants that were cited by people, such as *Psidium guayava* and mango *Magnifera indica* and other plants, see results and appendices. The photo manuals with medicinal plants and photos of some parasitic diseases were based on information and data obtained from literature researches, especially from the manual “A field manual of traditional animal health care practices in Nairobi Kenya (1996) and the book Botanika from Novák J. and Skalický M. (2008), Kubik *et al.*, (2010) was as well used, in general all the information obtained during the literature research was a great literary pillar for the preparation of questionnaires and manuals.

### **Choice of provinces**

The following regions Luanda and Benguela were chosen for the reason that there is a great agglomeration of the population as a result of that is the appearance of various diseases, the latter two Huambo and Bié, were chosen by the justification that in these provinces is more concentrate the animal production and agriculture activities, for sure more number of population with traditional and culture knowledge.

### **4.3 Study Area**

The study was based on four regions of the country as mentioned above: Luanda the capital city of Angola, Huambo and Bié (the central plateau in the country) and in the littoral city of Benguela (Figure 3). In these four regions was done a search in the month of July and August 2013 in form of questionnaires, conversations and recognize of photos of parasitic infection and plants from the manuals, with local people, students and workers as mentioned above. **Luanda**, with an area around 18,826 km<sup>2</sup> and a population 8 million

(mission-Angola, 2009), the population extension on this province is almost half of all the population of Angola. Furthermore as a consequence of population agglomeration on this city, there is a large deficit on food production for this whole population and thus increased malnutrition especially in children and the emergence of varies diseases, including malaria and diarrheal diseases. Is the capital of the country, however with an assortment of issues concerned to socio-economic life and problems on food security.



**Figure 3:** Geographic location of the four provinces (Orig. Edmárcia Leonor C. Lumbo)

**Huambo:** The province is located in central part Angola (Figure 3), with an area of 34,270 km<sup>2</sup> and population around 2 million. The region is characterized by cold winter, in the dry season the temperature can achieve 4 °C and does not differ much from **Bié** province that lies about 165 km from the city of Huambo, with an area of 70 314 km<sup>2</sup>, population around 1, 200, 000 people. The fourth province is **Benguela** one most developed cities of the country, population rounds in 2 million, with tropical dry climate (mission-Angola, 2009).

The questionnaires were elaborated in English language; see (Appendices), then translated to Portuguese, the official language spoken in the country and in a few cases related to rural areas in Umbundu language, which is the second most spoken language after Portuguese in the country. Approximately 26 % of the population speaks this Umbundu language mostly in the central and south regions of the country (CISA, 2011). The interviews were carried out by the author, a veterinarian worker from Institute of Veterinary Services (in Bié province), and a nurse from maternal and child centre of Samba in the province of Luanda in addition to a nurse from paediatric hospital of Benguela province.

#### **4.4 Data Analysis and Processing**

The results shown in this work were processed and demonstrated individually by excel tables, graphics illustrations, descriptive percentage. Moreover the three groups (workers from MINSA, MINADER and farmers), were analyzed to find out if there is any correlation between their level of knowledge on traditional medicine using the program IBM\* SPSS\* statistics version 21 properly the analysis of nonparametric Kendall Rank Correlation. The questionnaires were processed in such way, that the numbers and data obtained during the research may be representative for the four focused regions moreover for the country in general, for the reason that the way of life as well as habits and costumes does not differ greatly in all regions of the country.



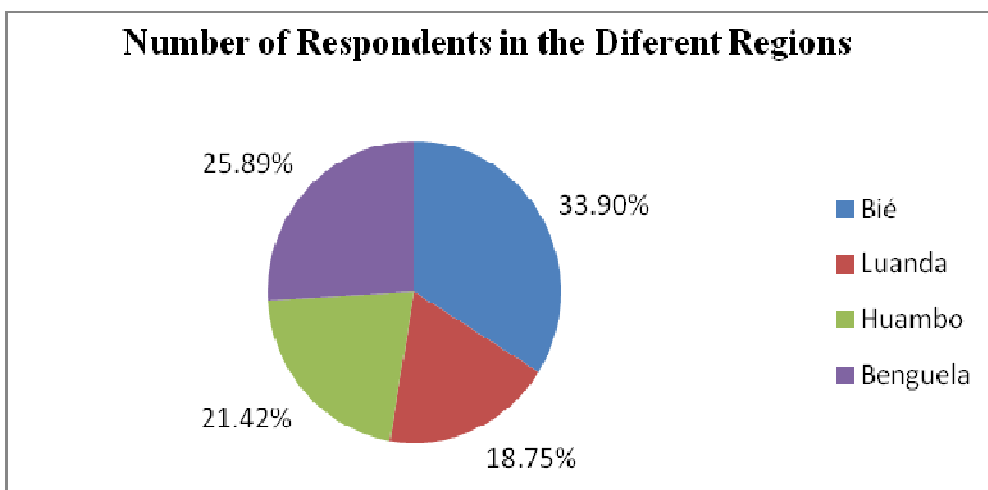
## 5. Results

The survey research of this work was carried out in four provinces of Angola (Luanda, Benguela, Huambo and Bié). A total of 112 respondents were obtained. From these respondents, 23 questionnaires were from hospitals and medical centers from Ministry of Health (Ministério da saúde, MINSA), 15 questionnaires from small farmers, 21 questionnaires from Institute of Veterinary Services (Instituto dos Serviços Veterinários, ISV) and 53 questionnaires from other different people including students from various educational levels in addition to rural population. The age group ranged from 25 and 79 years old. A total of 58.03 % of the respondents were female and 41.9 % were male. The largest number of respondents was from observed from Bié province with 33.9%, followed by Benguela province at 25.89 %, Huambo with 21.42 % and least from Luanda at 18.75 %, as indicated in the graph below (Table 3 and Graph 2).

**Table 3:** Number of respondents divided in four regions

Bié	Luanda	Huambo	Benguela	respondents
6	1	8	6	ISV
7	8	2	6	MINSA
6	1	4	4	Farmers
19	11	10	13	Students and householders
38	21	24	29	112

(Orig. Edmárcia Leonor C. Lumbo)



**Graph 2.** Percentage of respondents in the four regions (Orig. Edmárcia Leonor C. Lumbo)

Considering the assumptions made, it is concluded according to the statistical test that the majority of the population had a vast knowledge on the use of traditional medicines for the treatment of parasitic diseases as shown in table 4 below, where the null hypothesis was omitted, the opposite of the established or alternative hypothesis. This was applied for the three groups of respondents (MINSA workers, ISV workers and farmers), the category of students and householders was omitted from the test, for the reason that data was already established, because all respondents (100 %) in this category confirmed that they have some knowledge on the use of these plants and methods of uses.

**Table 4:** Test of the hypothesis one

**Hypothesis Test Summary**

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Farmer is normal with mean 0.377 and standard deviation 0.66.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
2	The distribution of Minsa is normal with mean 0.660 and standard deviation 0.83.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.
3	The distribution of Minader is normal with mean 0.585 and standard deviation 0.80.	One-Sample Kolmogorov-Smirnov Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

## 5.1 Plants Assessment

### 5.1.1 Category of Students and Householders

Most of respondents had some knowledge on alternative medicine and already had contact with some plants to cure several diseases. The most referred plants in this category were: *Chenopodium ambrosioides*, *Allium sativum*, *Aloe* ssp., *Azadirachta indica*, *Ocimum basilicum*, *Rapanea melanophloeos*, *Ricinus communis*, and *Tagetes minuta*, see appendices. These plants are used by the population even without help of an expert on traditional medicine. This is capable to be dangerous for the same population. The plant of neem (*Azadirachta indica*) is known as “cura tudo” what means cure everything in Portuguese language. In Luanda province and Benguela province, this plant is often used by people even without help from professional personnel. The table 5 shows the recognized plants by respondents of students and householders. From 28 plants contained on the manual, about 60.8 % of the plants from the manuals were recognized while 39.2 %, were identified as not been used on traditional treatment of parasitic diseases.

**Table 5:** Plants from the manual known by students, number of citations and used parts

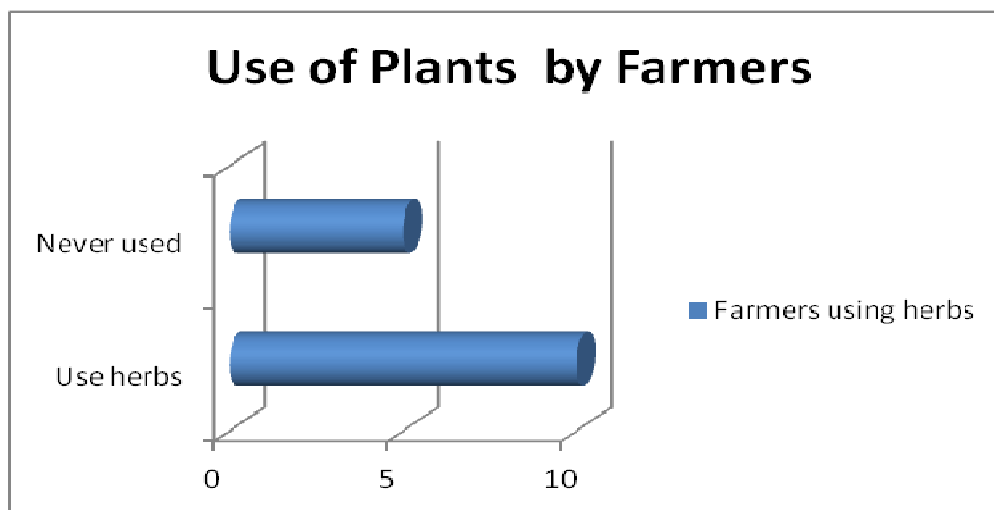
Scientific name	Local name	Portuguese name	Citation	Applications	Part used
<i>Adansonia digitata</i>	unkwa, mucua	imbondeiro	2	belly ache	fruit
<i>Allium sativum</i>	oalho	alho	19	diarrhea , belly ache, worms	leaves, fruit
<i>Aloe</i> spp.	otchandala	babosa, aloe	18	scabies, external parasites, wounds, lice, oxiurus	leaves
<i>Azadirachta indica</i>	onhime, Nhime	nim, amargosa	10	oxiurus, ticks, malaria	leaves
<i>Capsicum</i> L.	olundungo, caluyua	gindungo, piri-piri	2	worms in dogs	fruit
<i>Curcuma maxima</i>	atila, olombi vio muto	bobora grande	4	stomach ache, belly ache	leaves, fruit, seeds, petiole
<i>Chenopodium ambrosioides</i>	etiambulo	santa-maria, quenopodio	20	worms, oxiurus, malaria	leaves
<i>Lantana</i> L.	fruta macaca	cambara, lantana	8	oxiurus, malaria	leaves
<i>Musa</i> spp.	ombanana, ahondio	banana	7	antidiarrheal, belly ache, cramps, wounds	fruit
<i>Ocimum basilicum</i>	ondjicao	manjericao de folha larga	14	belly ache, cramps,	leaves
<i>Rapanea melanophloeos</i>	Ungolo	anonymous	8	malaria, oxiurus, belly ache	leaves, crust
<i>Ricinus communis</i>	olomolo	mamona, ricino	21	malaria, oxiurus, worms, wounds	leaves, seeds
<i>Salvadora persica</i>	aculala	arvore escova de dente	1	malaria, worms	crust
<i>Sesbania sesban</i>	cayendje	sesbania	5	wounds, oxiurus, ectoparasites, scabies,	crust, roots
<i>Tagetes minuta</i>	othimbumba, tchisonde	hortela preto	15	belly ache, cramps,	Leaves, crust, roots
<i>Tamarindus indica</i>	tamarindu	tamarindo	2	cramps	roots
<i>Teclea nobilis</i>	ulemba	mulemba, mulembeira	8	belly ache, cramps,	

(Orig. Edmárcia Leonor C. Lumbo)

From 28 plants contained in the manual of photos, 17 plants were recognized as used against parasites, while 11 of them were cited as not used. Subsequently were added 9 more species of plants that were not increased in the manual of photos, these include: *Pisidium guajava*, of which the leaves of these plants are used against malaria, diarrhoea if used in combination with onion as a past. The other is *Sesamum indicum* used to cure wounds from a pulp of the roots, *Nicotiana tabacum* the leaves to fight against fleas, *Phaseolus vulgaris* the leaves against scabies, *Zinger officinalis* roots used on wounds and against diarrhoea, *Magnifera indica* are used as a paste and powder from the crust to cure malaria, *Solanum lycopersicum* leaves used in the treatment of scabies .Other plants that were added include ofilanganga and mutunda, known by local names. These last could not be translated or identified in Portuguese name and no pictures were taken.

### **5.1.2 Farmers Plants Assessment**

From 15 farmers involved in the research, a large number of them have had used some traditional herbs to cure or prevent parasitic diseases. From this category the most cited plants did not differ from the first category of students cited above. The table 6 below shows the different answers in this group of farmers. In this category of 15 farmers, 66.7 % of respondents, of which corresponds to a number of 10 farmers have made use of some plants while 33.3 % a number of 5 farmers never use unconventional methods (graphic 3). The vast majority in this category of farmers buy these medicines from vendors, who sell these remedies already prepared and only few respondents (2) obtain directly from their fields or home gardens, in this last case for example *Chenopodium ambrosioides*, they always have in some garden near home.



**Graph 3.** Number of farmers using herbs against parasites (Orig. Edmárcia Leonor C. Lumbo)

**Table 6.** Number of citation in plants by small farmers

Latim name	Local name	Possible use	Parts used	Citation
<i>Aloe</i> spp.	aloe, otchandala	wounds, skin problems	leaves	6
<i>Allium sativum</i>	oalho	belly ache	bulb	6
<i>Azadirachta indica</i>	onhime	ticks, belly ache, wounds, fleas	leaves, seeds	2
<i>Chenopodium ambrosioides</i>	etiambulo	belly ache, wounds, worms	leaves, trunk	6
<i>Musa</i> spp.	ombanana	wounds	leaves	2
<i>Nicotiana tabacum</i>	acaia	fleas, ticks	leaves, seeds	1
<i>Psidium guayava</i>	olongayawa	worms, wounds, belly ache	leaves	4
<i>Rapanea melanophloes</i>	úngolo	wounds	leaves, trunk	1
<i>Ricinus comunis</i>	olomolo	worms	seeds, leaves	2
<i>Sesbania sesban</i>	cayendge	flies, belly ache	all parts	2
<b>Total of respondets</b>				<b>15</b>

(Orig. Edmárcia Leonor C. Lumbo)

### 5.1.3 Workers from Ministry of Health

From this category of workers from Ministry of Health as mentioned above were filled a number of 23 questionnaires. The most cited plants were *Chenopodium ambrosioides* and *Psidium guayava* (table 7). Nevertheless many of respondents in this group probably not agree with the use of traditional medicines, for the reason that most of times the patients simply do not know how to correctly use these plants, which may origin many health problems in the future, when are not correctly used these medical herbs.

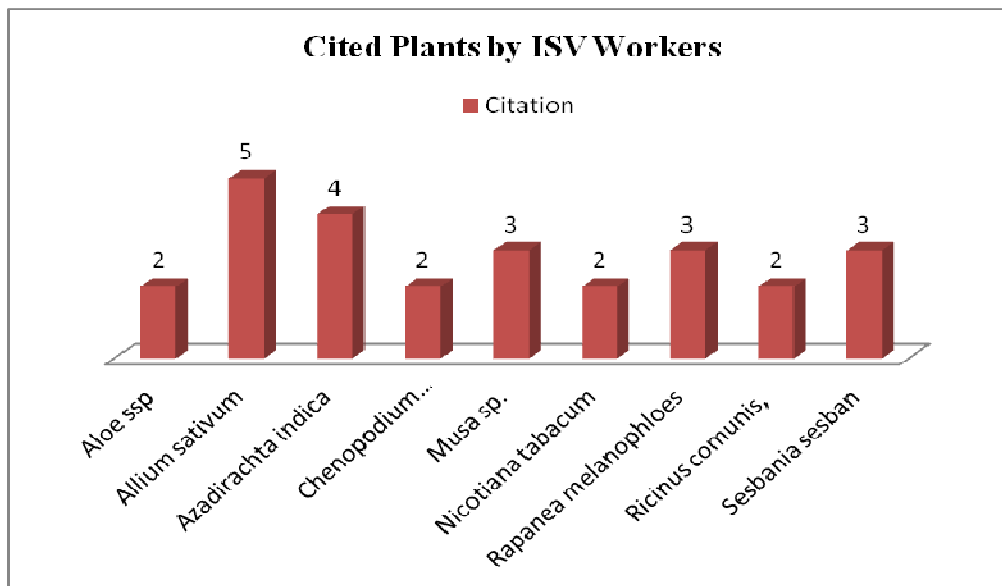
**Table 7.** Citation of used plants by workers of MINSAs

Latin name	Local name	English name	Citation
<i>Aloe</i> spp.	aloe, otchandala	aloe	6
<i>Allium sativum</i>	oalho	garlic	5
<i>Azadirachta indica</i>	onhime	neem	2
<i>Chenopodium ambrosioides</i>	etiambulo	wormseed	11
<i>Musa</i> spp.	ombanana	banana	0
<i>Nicotiana tabacum</i>	acaia	tobacco	0
<i>Psidium guayava</i>	olongayawa	apple guava	10
<i>Rapanea melanophloes</i>	úngolo	cape beach	5
<i>Ricinus comunis,</i>	olomolo	castor	4
<i>Sesbania sesban</i>	cayandge	sesbania	1
anonymous	mbamgavilha	anonymous	2
anonymous	ekakati	anonymous	3
anonymous	vindongo	anonymous	3
anonymous	ofilanganga	anonymous	5
anonymous	kapakapa	anonymous	2
<b>Total of respondents</b>		<b>23</b>	

(Orig. Edmárcia Leonor C. Lumbo)

#### 5.1.4 Institute of Veterinary Services Plants Assessment

Workers from Ministry of Agriculture Rural Development and Fisheries (MINAGRI) specifically, from the Institute of Veterinary Services and other workers from the Central Laboratory of Veterinary of Angola in the section of parasitology located in Huambo province, completed 21 questionnaires. The most cited plants were *Allium sativum*, *Azadirachta indica*, *Sesbania sesban*, which is not different from the groups above as illustrated in graph 4. Additional plants known by local names as ekakati, ofilanganga, mbangavilha were included. Most of respondents observed that unconventional medicine and methods are most used in rural areas than in the cities. The reason is attributed to difficulties to find medicines in these rural areas and the absence of veterinaries. The farmers have to find alternative medicine to minimize the effects with first aids.



**Graph 4.** ISV workers cited plants (Orig. Edmárcia Leonor C. Lumbo)

**Table 8:** Correlation in the level of knowledge on traditional medicine of MINSA and MINADER workers

Kendall tau_b	MINSA	MINADER
<b>Correlation Coefficient *</b>	1.000	0.896
<b>P value</b>	-	0.000
	MINSA	Farmers
<b>Correlation Coefficient *</b>	1.000	0.563
<b>P value</b>	-	0.000

\*At Significance level 0.05



In the attempt to correlate the Knowledge on traditional medicine of the groups from MINSAs and MINADER workers, there was found that, the knowledge concerning to the use of plants of these groups was highly correlated ( $r = 0.896$ ;  $p = 0.000$ ) at 95% of confidence interval, meaning that the level of knowledge on traditional medicines from these groups have a high correlation (table 8) above. On the other hand when was compared the knowledge of farmers with MINSAs workers, the correlation was relatively linked ( $r = 0.563$ ;  $p = 0.000$ ) in comparison with the first correlated group (MINSAs vs. MINADER), meaning that their knowledge in this contest are not the same (MINSAs vs. farmers).

## **5.2 Ways of Administration of the Medicines**

Administration of herbs these depends on the type of plant, depends on form of remedies, the part of plant that will be used and also depends on the type of parasite against who will be used. The ways of use also vary from one place to another place, often linked to culture and habits and customs of each region (Diassonama, 2011). During interviews with workers from Institute of Veterinary services (ISV) and also workers from Ministries of Health (MINSAs), was observed information that sometimes the population makes use of some herbs without a help of personal that, understand how to correctly administrate these plants. They also observed that an improvement in relation to information about ways of preparation, transformation and even deepen knowledge on correct dosage of each medicine can be necessary for people who are often using these medicines. And they advise the population, moderation during the use of these herbs.

### **5.2.1 Transformation of the Medicines**

Most plants are transformed into remedies that can be after used as, syrups, oils, compresses, in form of powders, juices, inhalations and can be made after boiling of the leaves, or of roots mainly, sometimes these remedies can be administrated in form of pastes or drying naturally in the sun light (ITDG and IIRR, 1996). The period of conservation of medicaments depend on the type of product, but are found a lot of problems with conservation of these medicines. Consequently the different forms of preparation and uses cited by the respondents agree with what was described by ITDG and IIRR of Kenya (1996), which states that medicinal plants are prepared in different ways and forms and ingested depending on the type and form of the plant and the disease on

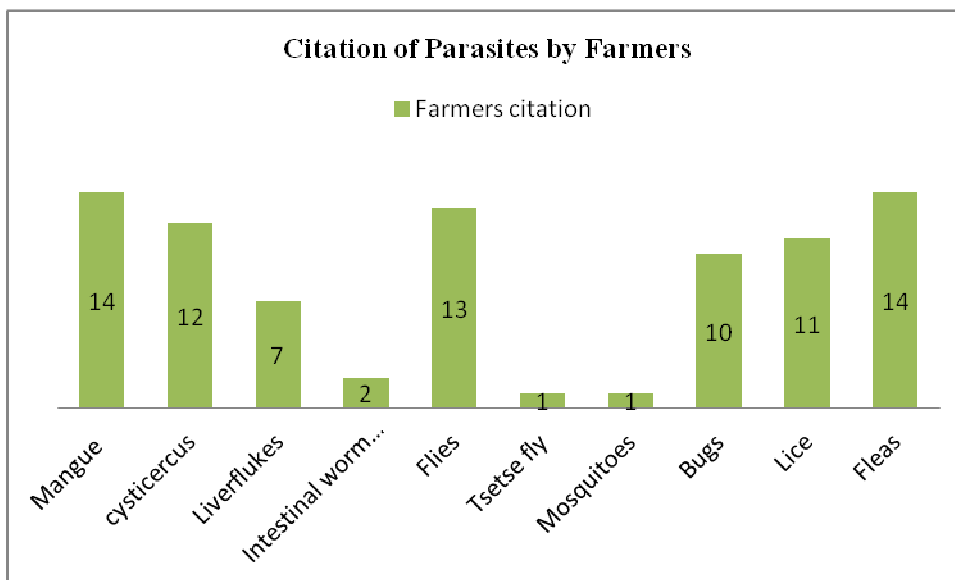
which will be used the medicine. In the case of Angola also depends on the region and the customs, culture and traditions of each region. All of the plants mentioned are administrated in oral, rectal and external form.

### 5.3 Parasites Assessment

#### 5.3.1 Farmers

The graphic 5 shows the parasites mentioned as most affecting the animal production according to the responses of small farmers. Approximately 93.3 % of the respondents have problems with external parasites as flies, ticks, fleas in poultry production and pets, as well as endoparasites, zoo noses as taenioses (cysticercosis) and liver flukes in cattle and swine production.

In the table 9 below are described the parasites that mostly plague the animals in farm production. These have been the cause of much loss and spread of zoonotic diseases to humans. In most of the rural areas inspections and veterinaries services most of times are not achieved, the zoo noses are a big problem for the population in these areas.



**Graph 5.** Cited parasites by farmers in their production (Orig. Edmárcia Leonor C. Lumbo)

**Table 9.** Parasites and their predominance in animal production (farmers)

<b>Portuguese name</b>	<b>English name</b>	<b>Local name</b>	<b>Animal</b>
<b>ácaros (sarnas)</b>	mites (scabies)	anonymous	cattle, dogs
<b>carrapatos, carraças</b>	ticks	ovihupa	dogs, poultry
<b>cisticercose (ténia)</b>	cysticercosis	ovassa	pork, cattle
<b>fasciola</b>	liver flukes	anonymous	cattle, dogs
<b>lombrigas, bixas</b>	intestinal worm	anonymous	dogs, cattle, sheep, goats, poultry
<b>moscas</b>	flies	olohi	dogs, poultry, cattle, pork, for all the creation
<b>mosca tse-tse (tripanosomiase)</b>	tsetse fly	olohi	cattle
<b>mosquitos</b>	mosquitoes	oluhamue	appear to all
<b>perceveijos</b>	bugs	otchihopio	dogs, cats
<b>piolhos</b>	lice	olona	pork, poultry
<b>pulgas</b>	fleas	olopulukua	dog, poultry

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### 5.3.2 Institute of Veterinary Services

As shows the table 10 below there are many problems with parasites in animal production. From this category of respondents were filled 21 questionnaires and most of the respondents mentioned that the parasitic infections that more plague the animal production are endoparasites as helminthes and external parasites as flies. Almost all the respondents in this category mentioned similar names of parasitic diseases that they find out during they work with breeders and inception works in slaughterhouses. This category includes also employees from the laboratory of parasitology.

**Table 10.** Parasitic diseases in animals from ISV workers

<b>Animal</b>	<b>Parasites</b>
<b>Cattle</b>	<i>Teania saginata</i> , flies, scabies, <i>Fasciola hepatica</i>
<b>Cats, dogs</b>	mites (scabies), bugs, ticks, fleas, intestinal worms ( <i>Ascaris</i> spp.)
<b>Goats</b>	Intestinal worms, flies
<b>Poultry</b>	fleas, lice, ticks,
<b>Sheep</b>	intestinal worms, flies, bottle jaw
<b>Swine</b>	<i>Teania solium</i> , lice, flies

(Orig. Edmárcia Leonor C. Lumbo)

Subsequently was also cited dermatophilosis, a contagious disease, affecting cattle, sheep, goats and pigs, caused by the bacterium *Dermatophilus congolensis*, which is related with the large appearance of flies. From 23 completed questionnaires Intestinal worms, lice (86.9 %), *Oxyuris equi*, mosquitoes which carries the genus *Plasmodium* (65.2 %), scabies (65.3 %), elephantiasis (52.1 %) were the most cited parasitic diseases by these group of interviewers. Was as well mentioned that most of cases came from rural areas (table 11), what coincides with the answers from ISV workers when observed that most of these diseases came from rural areas were not correctly inspected the food production and hygiene and sanity conditions are a big problem as mentioned above.

The Human African Trypanosomiasis (HAT) and shistosomosis were observed and mentioned by MINSA workers, that only in North regions of the country appear a few number of patients in lasts years, what also correspond with recent searches of Ministry of Health (MINSA). As mentioned above thanks to the program of combating trypanosomiasis led by the Institute of Combat and Control of Trypanosomiasis of Angola (ICCT) in collaboration with the National Health System of Angola (SNS) and World Health Organization (WHO), which are trying to eradicate and catch *Glossinas* flies since many years (MINSA, 2012), with satisfactory results on reduction of patients with this infection.

**Table 11.** Parasitic diseases in humans as identified by MINSA respondents

Portuguese names	Local name	English name	Citation	Percentage
ácaros (sarnas)	anonymous	mites (scabies)	15	65.3 %
carrapatos, carracas	ovihupa	ticks	0	0
cisticercose (ténia)	ovassa	cysticercosis	2	8.7 %
elefantíase	tala	roundworms (philariosis)	12	52.1 %
esquistossomose ou bilharziose	anonymous	schistosomiosis	2	8,7 %
fasciolase	anonymous	liver flukes	1	4.4 %
lombrigas, bixas	anonymous	intestinal worm	17	7.3 %
moscas	olohi	flies	5	21.7 %
moscatse-tse (tripanosomiase)	olohi	tsetse fly	1	4.4 %
mosquitos (plasmodio)	oluhamue	mosquitoes	15	65.2 %
perceveijos	otchihopio	bugs	9	39.1 %
piolhos	olona	lice	20	86.9 %
pulgas	olopulukua, bitacaia	fleas	4	17.3 %
oxiuri	maculú	oxyuris	12	52.1 %

(Orig. Edmárcia Leonor C. Lumbo)

### 5.3.3 Category of Students and Householders

This group were more interactive, 21 questionnaires completed in animal parasites and 11 in human parasites using the manuals, where the people had to recognize if have seen or not the parasitic diseases from the photos of the manuals. From that echinococosis disease was not mentioned, what also corresponds with answers from workers of Institute of veterinary Services (ISV) where was not mentioned as well, table 12. The mostly mentioned parasites from this category were *Ascaris* spp., mites, ticks, fleas, flies, cisticercosis and *Fasciola hepatica*. Regarding to humans parasites, this category of respondents extra cited Oxyuris, malaria and intestinal worms which correspond with a mention from workers of Ministry of Health (MINSA). From this group, 2 questionnaires

were filled in Luanda province, 3 questionnaires from Bié province and 6 questionnaires completed in Benguela province related to parasitic diseases on human table 13 below.

**Table 12.** Parasites in animals as identified by students and householders

<b>Parasite</b>	<b>Luanda</b>	<b>Bié</b>	<b>Benguela</b>	<b>Huambo</b>
<i>Ascaris</i> spp.	4	5	5	5
bottle jaw	3	2	3	5
<i>cysticercus</i>	4	5	4	5
echinococcus	0	0	0	0
fleas	4	6	5	5
flies	5	4	5	0
leeches	0	0	0	4
liver flukes	3	5	5	5
tsetse flies	2	0	5	3
ticks	5	6	5	5
<b>Total of respondents</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>5</b>

(Orig. Edmárcia Leonor C. Lumbo)

**Table 13.** Citation of parasites in humans by householders and students

<b>parasite</b>	<b>Luanda</b>	<b>Bié</b>	<b>Benguela</b>
<i>Ascaris</i> spp.	2	3	6
flies	2	3	6
fleas	2	2	1
scabies	1	2	4
<i>Oxyuris vermicularis</i>	2	2	6
mosquitoes (malaria)	2	3	6
roundworms (philariosis)	2	2	5
schistosomiosis	1	0	2
tapeworms (taeniosis)	2	2	6
<b>Total of respondents</b>	<b>2</b>	<b>3</b>	<b>6</b>

(Orig. Edmárcia Leonor C. Lumbo)

## 5.4 Prevention

During interviews, according to workers from Ministry of Health (MINSA), the major part of the respondents mentioned that often there are several problems against the prevention of diseases specially in children, as a result of distraction by the utter neglect of the parents, there are several problems such as, lack of domestic hygiene, mostly on rural areas, lack of control with the children, sometimes children are left with another children at home, because the parents have to drudge for food, another problems is related to social-economic life. Of which are several health problems on a large scale in peri-urban and rural areas, thus the cycle of these infections, with a higher incidence on these areas, the population in these areas suffer with lack of almost everything (treated water, food, hospitals, markets) for maintenance of day by day life, in other words, the population on rural areas suffer with a several situation of poverty.

During the researches was mentioned that, the elimination of parasitic diseases transmitted by water, has concrete interventions in the environment such as, the extension of sewerage in higher risk areas, water treatment, construction of sewers and better control of rivers, and other measures related to education and surveillance of the population in general with early identification of cases, an epidemiological investigation and treatment of all infected individuals, are some prevention methods mentioned by workers from MINSA. In case of Malaria for example which is endemic in the region as mentioned above, there are many ways of trying to eliminate the vector of *plasmodium*, the mosquito *Anopheles* with the use of repellents, such as the leaves of the neem (*Azadirachta Indica*) plant is in most of times used as a repellent, another method to prevent the mosquitoes bites, is the use of mosquitoes netting. There was also mentioned that occasionally is used the petrol oil or the leaves of *Musa* sp. as a repellent of insects and major part to fight against flies and fleas.

## 5.5 Importance of the Traditional Medicine

Although modern medicine is developing, still now is not possible and sufficient to provide the demand for medical and veterinary services, especially in rural areas. The ethno botany, ethno veterinary and phototherapy comes to help and minimize this need. According to Diassonama (2001), traditional practices that are transmitted orally from generation to generation, has been a great help to save animals lives and even human lives for many times. However there is a need to search more and get more information about

the real composition of used plants to avoid future problems of intoxication, self medication and health gaps caused by misuse of these plants. The use of natural medicines has a fundamental paper during the eradication of many parasitic diseases. According to MINSA (2012), the use of traditional medicines in the country in recent years has gained popularity not only in rural areas but also in urban locations.

## **6. Discussion**

From the results obtained in this study, it was found that traditional medicine is widespread by regions of roughly the four provinces, subsequently all the country. However there are observed several problems both in animal health and as well as public health such as: Poor and insufficient medical assistance to people, poor sanitary and hygiene conditions mostly in rural areas, lack of knowledge concerning to the correct dosages of the traditional medicaments, problems with inspection on hygiene and sanity of the animal production and processing, many problems with parasites as well as in human health as in animal creation were as well confirmed.

In addition to that, observations shows similarity with different related studies made recently. According to Calum (2005), the World Health Organization (WHO) reported in 1997 that parasitic zoonoses were a cause of roughly 43 % deaths in developing countries, where are several public health problems and a large lack on medical assistance. Angola was increased to the countries with endemic situation on malaria and infant diarrhoeal diseases and the country is prone to various issues on medical assistance, with this, the government of the country is trying to increase their spending also in relation to investigation on traditional medicine (MINSA, 2012), accordingly during interviews was observed, that there was a controversy on the part of workers, the complaint of the lack of care and negligence by the population, was as well mentioned that, great efforts have been made in relation to medical assistance for the population in hospitals. On the other hand states that, the population is not satisfied with the mode of attendance in hospitals and health centres. However, it is necessary to notice that there are still many taboos to be reviewed in respect of health care in the country, during interviews were also mentioned several zoonotic infections, as for example the case of the cysticercosis.



According to the portalangola, (2008) the Institute of Veterinary Services inspected several slaughterhouses are ongoing and most of them had numerous hygiene problems. Similar situation to that, was observed during the research and completion of the questionnaires that, for example in case of meat, is sometimes sold in informal markets, without any protection in these markets, exposed to the sunlight and sometimes with a large appearance of flies and another insects or parasites.

According to Queza (2010), traditional remedies as plant extracts, leaves, roots, juices and others, are sold in informal markets by people and herbalists, without any control and inadequate storage conditions. During the interviews 75.9 % (85 respondents) had some contact with traditional remedies; however these medicaments are used almost without any prescription or are empirically used by people. The World Health Organization and MINSA (2012) also reported that 80 % of the population in Africa use the traditional medicine for first aids. However there is a need of increase the knowledge on the use of these medicines. Approximately the entire respondents during interviews mentioned malaria, intestinal worms and lice as the major problems of public health what coincide with recent reaches done by CISA which reported that 35 % of the mortality in the hospitals is caused by malaria (CISA, 2011), statistical data from MINSA and WHO (2012) also estimated that roughly 25 % of infant death in Angola is caused by malaria and diarrheal diseases.

## **7. Conclusion**

This work was done with the objective to know the current status of the use of traditional plants against parasitic diseases in Angola, identify the most used plants and parasitic diseases that plague more the country. The majority of respondents recognized numerous plants moreover known something concerning to their use, although there is still a large break on information in relation to the actual composition and proper use of these plants. 75.9 % of the respondents use traditional medicine to minimize the appearance of parasites and 24.1 % do not make use of herbs on fight against these infections, than, were in total mentioned 32 plants used in the treatment of parasitosis mostly in rural areas. The incidence of parasitic diseases is however a problem in the region, were mentioned at all 12 different parasites in animals and 12 parasitic diseases that more plague the public health from the manual and added liver flukes (*Fasciola hepatica*) with just one mention in humans. All respondents unanimously considerate follow opinions what correspond to answers of the follow hypotheses: Most of the respondents had some knowledge linked to the use of traditional medicine: 75.9 % of the respondents had information concerning to herbal use, form that, a number of 10 which correspond 66.7 % of 15 farmers have made use of some plants and 33.3 % a number of 5 farmers said do not use alternative medicine. The hygiene and sanity conditions are poor and contribute for the apparition of these illnesses: many problems of sanity and hygiene are finding on rural and peri-urban areas, for the reason that sometimes people just do not listen and do not put in case the advertence of MINSA workers by seminars and information campaigns on health by (MINSA workers).

## **Recommendations**

During the interviews, approximately 75.9 % of the respondents use medical plants, what correspond to the majority of them; however there is a great lack of information and control during the use of these medicines. There would be need more investment on searches concerning to traditional medicine, more tests and laboratorial analyzes regarding the real composition of these plants, inspection on the use of these remedies have to be increased for the reason that most of times people use this medicine even with no good references. And it would be in the responsibility of Ministry of Health (MINSA) and Ministry of Education.

It is necessary to give attention on medical assistance, better control and improvement on health care for the population. During interviews, situations on poor hygiene and sanitation by the population, mostly in rural areas (appendices 12) were identified as major causes of the spread of various diseases, lack of proper inspection in animal production, in this context there would require from the part of MINADER, properly the Institute of Veterinary Services (ISV) to make an improvement in inspection on animal production and more education and training targeted to rural population concerned to hygiene and sanitation. More extensions and seminaries with farmers, breeders and householders in peri-urban and rural would be a great way to inform the population basis. Concerning to handling of traditional medicines, a monitoring is required for the sale and distribution of these remedies.

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## 9. Appendices



**Appendices 1:** *Pisidium guajava* (Photo: Edmárcia Leonor)



**Appendices 2:** *Magnifera indica* (Photo: Edmárcia Leonor)



**Appendices 3:** *Sesbania sesban* (Photo: Edmárcia Leonor)





**Appendices 4:** *Adansonia digitata* (Photo: Edmárcia Leonor)



**Appendices 5:** *Chenopodium ambrosioides* (Photo: Edmárcia Leonor)



**Appendices 6:** *Aloe* ssp. (Photo: Edmárcia Leonor.)



**Appendices 7:** Farmer in Bié (Photo: Frederico M.)



**Appendices 8:** Laboratory of Parasitology (Photo: Cossengue Luciano)



**Appendice 9:** *Azadirachta indica* (Photo: Edmárcia Leonor)





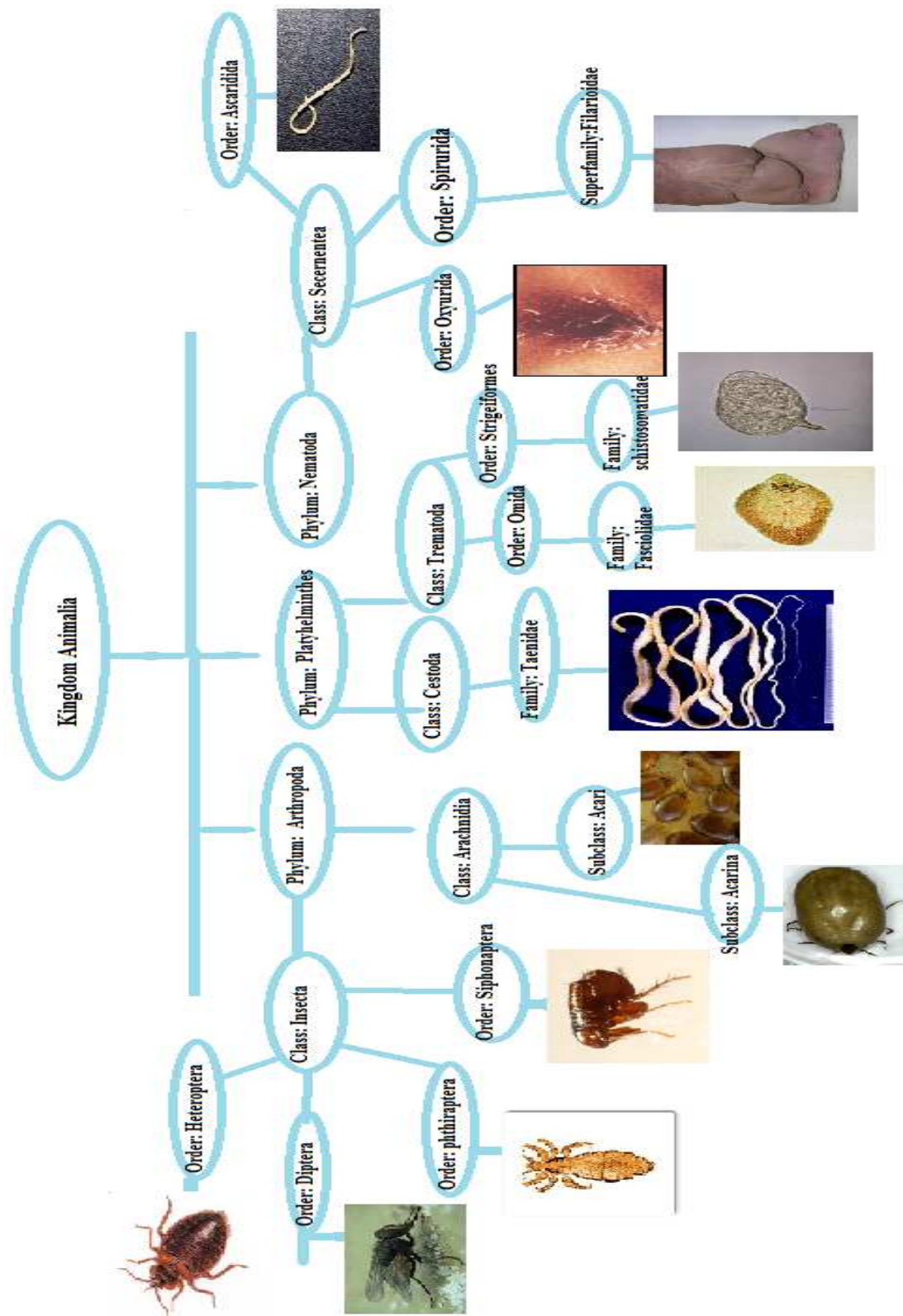
**Appendices 10:** *Curcuma maxima* (Photo: Edmárcia Leonor.)



**Appendices 11:** *Ocimum basilicum* (Photo: Edmárcia Leonor)

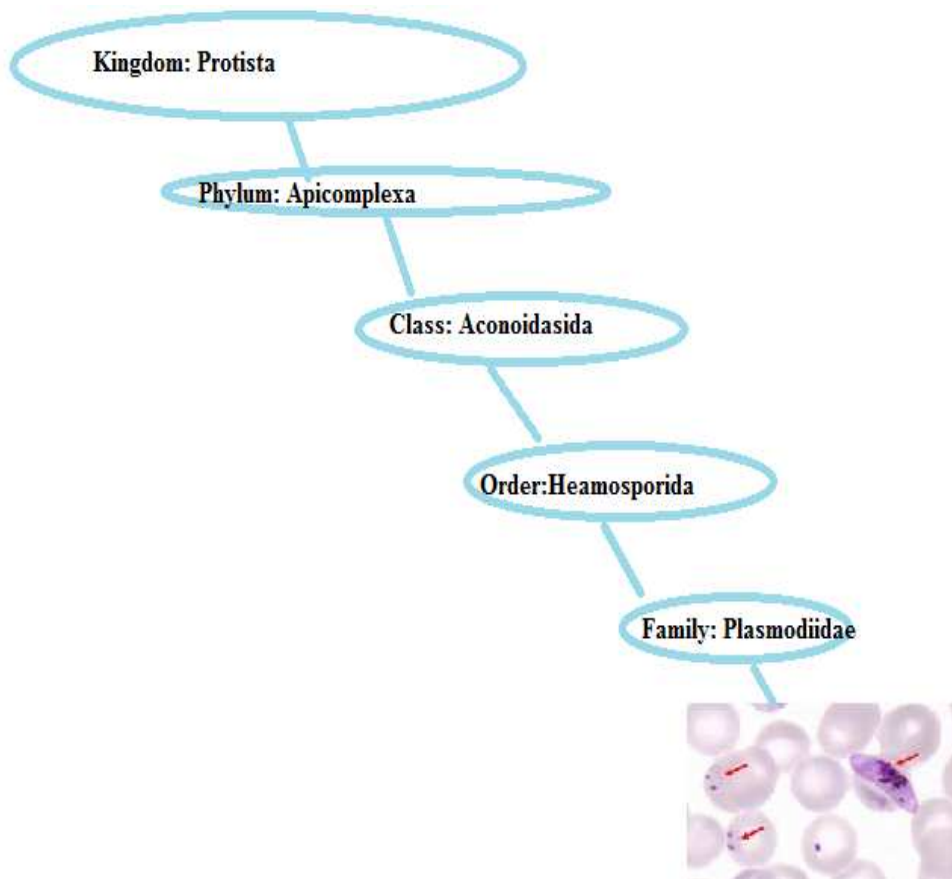


**Appendices 12:** problems of sanitation on rural and peri-urban areas (Photo: Rosário J.)



Appendices 13: Mentioned parasites classification





**Appendices 14:** *Plasmodium* sp. classification

**Appendices 15:** Questionnaire for workers and veterinaries from Ministry of Agriculture

Date:

Location:

Source:

Age:

1. What are the most frequently parasitic infections in the region?

Ruminants

Poultry

pets

2. Do you have any experiences with herbal uses for treatment of these parasites?

Yes..... No.....

3. If yes write almost 10 names of herbs that have you used for this?

4. What are the difficulties in the control of those infections?

5. What are the many used steps to prevent those diseases?

## Appendices 16: Questionnaire for workers from Ministry of Health

Date:

Location:

Source:

1. What are the most frequently parasitic infections in the region?

Adults

Children

2. Experiences with herbal uses for the treatment?

Yes..... No.....

3. Which plants have you used for?

Names

4. How are they used? Write yes or no.

Powder...Teas....Past....

5. What are the difficulties in the control of these infections?

6. What are the many used steps to prevent these diseases?

7. What do you think about the use of medical plants to eradicate parasites?

8. Which advantages do you find on the use of herbs?

**Appendices 17: Questionnaires for small farmers:**

Location: Name..... Education.....

Source:

Age:

1. From the list choose the most frequent parasites in the animal creation: (+) = frequent, (-) = not frequent (+/-) = once in a while.

parasites	signs	frequency	To which animal appears more often?
intestinal and stomachic worms	weight loss, weakness, big belly, dysentery, once in a while faeces with worms, abdominal pain		
cysticercosis	without signs in most of cases, presence of cysts in the meat		
bedbugs	skin problems, allergic symptoms		
fleas	fleas in the skin, ground, skin problems		
ticks <i>Plasmodium</i> (malaria)	presence of ticks, weight loss headache, vomiting, fever, convulsion		
tsetse flies	presence of fly		
mites	skin infections, presence of mites		
flies and mosquitoes	a lot of them in wet season, skin irritation, discomfort		
lice	eggs in the hair, irritation and itches		
schistosomosis	dysentery, fever, abdominal pain		

2. Do you use any herbs to eradicate some of these parasites? If yes from where do you take these plants, from your land, or you have to buy?

3. Write down in the table, some names of plants that you use for treating some of the problems above.

Plant name (Portuguese)	Local name (local language)	What for?	How do you use it?

4. What are the vantages of using plants or herbs to solve problems with parasitic infections?
5. What disadvantages we can find in the use of these plants?

**Appendices 18:** Questionnaires for students and householders (from the manual of plants)

Location:

Date:

Source:

Name ..... Education.....

From the manual choose the plants that you know and have used as a remedy against some parasitic infection mark (x) in each situation:

	Yes	No	have used	never used	never seen before
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Appendix 19: Questionnaires for students and householders (from the manual of parasites)**

Location:

Source:

Date:

Name ..... Education.....

From the manual choose the parasitic infections that you have seen or you know in animals here in the region, mark (x) in each situation:

- |     | Yes                      | No                       |
|-----|--------------------------|--------------------------|
| 1.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 8.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. | <input type="checkbox"/> | <input type="checkbox"/> |

.....

Location:

Source:

Date:

Name ..... Education.....

From the manual choose the parasitic infections that you have seen or you know in humans in the region:

- |     | Yes                      | No                       |
|-----|--------------------------|--------------------------|
| 1.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 8.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.  | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. | <input type="checkbox"/> | <input type="checkbox"/> |

**Appendices 20:** Table of some mentioned plants and respectively families

Scientific name	Local name	Portuguese name	English name	Family
<i>Adansonia digitata</i>	unkwa, mucua	imbondeiro	baobab	Malvaceae
<i>Allium sativum</i>	oalho	alho	garlic	Liliaceae
<i>Aloe</i> ssp.	otchandala	babosa, aloe	aloe, aloe	Asphodeloideae
<i>Azadirachta indica</i>	onhime, Nhime	nim, amargosa	neem neem	Meliaceae
<i>Capsicum</i> L.	olundungo, caluyua	gindungo, piri-piri	chilli peppers, piri-piri	Solanaceae
<i>Curcuma maxima</i>	atila, olombi vio muto	bobora grande	great bobora	Curcubitaceae
<i>Chenopodium ambrosiodes</i>	etiambulo	santa-maria, quenopodio	pigweed	Amarantaceae
<i>Lantana</i> L.	fruta macaca	cambara, lantana	lantana	Verbenaceae
<i>Magnifera indica</i>	omanga	manga	mango	Anacardiaceae
<i>Manihot esculenta</i>	kisaca,estranga	mandioca	cassava	Euphorbiaceae
<i>Musa</i> spp.	ombanana, ahondio	banana	banana	Musaceae
<i>Nikotiana tabacum</i>	acaia	tabaco	tobacco	Solanaceae
<i>Ocimum basilicum</i>	ondjicao	manjericao de folha larga	basil broadleaf	Lamiaceae
<i>Pisidium guajava</i>	olongayawa	goiaba	guava	Myrtaceae
<i>Phaseolus vulgaris</i>	otchipoke	feijao	bean	Fabaceae
<i>Rapanea melanophloeos</i>	ungolo	anonymous	cape beech	Myrsinaceae
<i>Ricinus communis</i>	olomolo	mamona, ricino	castor, castor	Euphorbiaceae
<i>Salvadora persica</i>	aculala	arvore escova de dente	tree toothbrush	Salvadoraceae
<i>Sesamum indicum</i>	anonymous	sesamo, gergelim	sesame	Pedaliaceae
<i>Sesbania sesban</i>	cayendje	sesbania	sesbania	Fabaceae
<i>Solanum lycopersicum</i>	amatia	tomate	tomato	Solanaceae
<i>Solanum melongena</i>	olosaca	beringela	eggplant	Solanaceae
<i>Tagetes minuta</i>	othimbumba, tchisonde	hortela preto	black mint	Asteraceae
<i>Tamarindus indica</i>	tamarindu	tamarindo	tamarind	Fabaceae
<i>Teclea nobilis</i>	ulemba	mulemba, mulembeira	anonymous	Rutaceae
<i>Zinger officinalis</i>	anonymous	gengibre	ginger	Zingiberaceae

Appendices 21: Examples of filled questionnaires

Questionário para os trabalhadores e veterinários do Ministério da Agricultura

Data: 07-08-2013  
 Localização: Huancayo  
 Nome: Alexandre Fernandes  
 Idade: 52

1. Quais são as infecções parasitárias mais frequentes na região?  
 No gado bovino, suíno, caprino  
 vermes (intestinais), cisticercose, maçoas  
 .....  
 Infecções em aves  
 pragas, tenias  
 .....  
 Em animais de estimação  
 pulgas, sarna, cisticercose  
 .....  
 Outros animais  
 .....

2. Tem alguma experiência com plantas medicinais no tratamento dessas doenças?  
 Sim  Não .....  
 3. Na tabela abaixo, escreva alguns nomes de plantas que podem ser usadas no tratamento de alguns dos problemas acima (parasitas).

Nome da planta (português)	nome local (língua local)	Para que fim?	Em forma de que usa? (chá, polpa, pó...)
nicotina	obunelo	sarna	banhos (folhas)
tabaco	Acara	pulgas	banho (folhas)
ginásal	otolo	limpa sarna	

4. Quais são as maiores dificuldades que se encontram durante o controle dessas infecções?  
 medicamentos medicina convencional  
 .....

5. Conhece alguns métodos para prevenir essas doenças?

Desparasitação  Pulverização   
 Outros métodos  
 limpeza dos currais  
 .....

Survey of MINADER (ISV) workers



Questionários para agricultores

Nome Delegado José Nível Académico 7º

Localização: B. R.

Idade: 40

1. A partir da lista escolha os parasitas que mais assolam a sua criação: (+) = freqüente, (-) = não freqüente, (+/-) = de vez em quando: limão Freqüência Em que animais é + freqüente?

vermes intestinais e do estômago	perda de peso, fraqueza, barriga grande, disenteria, de vez em quando fezes com vermes, dores abdominais	+/-	boi, ovelha, cavalo, baco
Cisticercoides	Sem sinais externos, presença de cistos na carne	+/-	boi
Perceveijos	Alergia, problemas na pele	-	-
Pulgas	Pulgas no pelo, no solo, problemas na pele	+	cão, gato, galinhas
Carrapatos	Presença de carrapatos perda de peso, problemas na pele	+	cão, boi,
Plasmodio (malaria)	dor de cabeça, febre, vômito	-	-
mosca tsetse	Presença de moscas	-	-
ácaros	Infeções da pele, presença de ácaros	+/-	boi, aves
moscas e mosquitos	Em maior escala na época de calor, irritação na pele, desconforto	+	boi, cão
piolhos	Ovos nos pelos, coceira, mal estar	+	porcos, aves
schistosomose	Desintéria, febre, dores abdominais	-	-

fasciola hepática

Farmers surveys

2. Já fez o uso alguma planta medicinal para erradicar alguns desses parasitas? Se sim, de onde obtém essas plantas? De seu próprio campo ou compra?

*Sim, faz uso, tem seu próprio campo*

3. Na tabela abaixo, escreva alguns nomes de plantas que podem ser usadas no tratamento de alguns dos problemas acima (parasitas).

Nome da Planta (Português)	Nome Local (língua local)	Para que fim?	Em forma de que usa? (chá, polpa...)
<i>santão, manio</i>	<i>asamba, Manica</i>	<i>vermes intestinais</i>	<i>folhas (chá)</i>
	<i>obwolo</i>	<i>diarria macula</i>	<i>folhas</i>
	<i>filomganga</i>	<i>vermes intestinais</i>	<i>chá</i>
	<i>mangavilha</i>	<i>diarria macula</i>	<i>folhas, Saube</i>

4. Quais são as vantagens no uso de plantas medicinais para resolver esses problemas?

*é barato, ajuda a saúde, não tem efeitos secundários*

5. Que desvantagens podem haver durante o uso dessas plantas?

*Não tem*

## Farmers surveys

**Questionário para os trabalhadores do Ministério da Saúde**

Data:

Localização: Luanda

Fonte: enfermeira

Idade: 42 Anos

1. Quais são as infecções parasitárias que mais assolam a região?

Adultos: Malaria, elefantíase, esquistossomose

Crianças: psoríase, sarna, oxiúria, piolho

2. Tem alguma experiências com plantas medicinais no tratamento dessas doenças?

Sim ..... Não X.....

3. Poderia citar alguma planta usada como medicamento contra tais doenças?

4. Como são usadas?

Em forma de pó?  Chá?  outras formas? .....

5. Quais são as maiores dificuldades durante o control desses parasitas?

deslocações de um posto p/ outros, mais  
exatidão, quando é difícil se ausentem

6. Que métodos se usam para prevenir essas doenças?

presença de limpa pela qualidade, publicidade  
sobre o modo como cuidar de um do  
crianças

7. O que acha sobre o uso de plantas para eliminar parasitas?

Acho bom

8. Encontram-se vantagens durante o uso dessas plantas medicinais?

Podem haver vantagens em casa

**Survey of MINSA workers**

Data: 17-07-2013  
 Localização: Benguela

Fonte:  
 Nome: Teósa Cunandala  
 Nível académico: 12ª classe

A partir do manual escolha plantas que conhece e tem usado como remédio contra alguma infecção parasitária, marque (x) em cada situação:

	Sim	Não <sup>conheço</sup> nunca usei	já usei	nunca vi
1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
21.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
22.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
23.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. oxiuri

8.

9. massagem, folhas pisar e meter no anus (unaculy)

13. doz de sarruja

gergelim (feridas)

tomate - sarna

feijão - sarna

Data: 06-07-2013

Localização: Benguela

Fonte: Estudante

Nome: Teósa Sampaio Educação: 11.9

Apartir do manual, escolha quais infecções parasitárias já viu ou conhece em humanos na região:

- | <del>SIM</del>                          | NAO                                 |
|---|-------------------------------------|
| 1. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 1. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 3. <input type="checkbox"/>             | <input checked="" type="checkbox"/> |
| 4. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 5. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 6. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 7. <input type="checkbox"/>             | <input checked="" type="checkbox"/> |
| 8. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 9. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 10. <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 12. <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

Data: 05-08-2013

Localização: Bie

Fonte: estudante

Nome: Elisa Ramos Nível académico: 9.9

Apartir do manual, escolha quais infecções parasitárias já viu em animais aqui na região, marca (X) em cada situação:

- | <del>SIM</del>                          | NAO                                 |
|---|-------------------------------------|
| 1. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 2. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 3. <input type="checkbox"/>             | <input checked="" type="checkbox"/> |
| 4. <input type="checkbox"/>             | <input checked="" type="checkbox"/> |
| 5. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 6. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 7. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 8. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 9. <input checked="" type="checkbox"/>  | <input type="checkbox"/>            |
| 10. <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 12. <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 13. <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

## Survey of students and householders in parasites